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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/769,270	01/26/2001	Seiji Shima	520.39555X00	4351

24956 7590 04/07/2005

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EXAMINER

PHAM, HUNG Q

ART UNIT	PAPER NUMBER
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2162

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/769,270

Applicant(s)

SHIMA ET AL.

Examiner

HUNG Q PHAM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.


SHAHID ALAM
PRIMARY EXAMINER

DETAILED ACTION

Response to Arguments

- Applicant's arguments with respect to claims 1, 4, 6 and 9 have been considered but are moot in view of the new ground(s) of rejection.
- Applicant is advised that should claim 9 be found allowable, claims 1, 4 and 6 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 4, 6 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 4 and 6 recite the limitation *said data stored in the virtual space*. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitations *said management facility*, and *said generic format files*.

There is insufficient antecedent basis for these limitations in the claim.

Claim 9 recites the limitation *said file stored in said virtual space*. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soltis et al. [USP 6,493,804 B1] in view of Dang et al. [USP 5,446,855].

Regarding claims 1 and 4, Soltis teaches a data management system for storages, suitable for a system having a plurality of hosts (FIG. 4, GFS CLIENTS) and a plurality of storages (FIG. 4, NETWORK STORAGE POOL) connected to a data transfer network (FIG. 4, SAN), comprising:

a converter facility (VFS), included in each said host, for converting a unit of data specific to an operating system (OS) on said host into a unit of data common to said storages (as illustrated at Col. 9, Lines 21-28, files under IRIX operating system in GFS CLIENT of FIG. 4 are converted into files common to storages by using VFS, and VFS is a conventional converter facility for converting a unit of data specific to an operating system on said host into a unit of data common to said storage, the function of VFS is discussed in Pub. No. 2004/0260853 A1 at paragraph [0072]); and

a management facility (DATA STORAGE DEVICE LOCK, Col. 9, Lines 48-56), connected to said hosts and said storages by way of said data transfer networks (Col. 8, Lines 15-20), for receiving a name of a unit of data common to said storages from said hosts (data files of storage devices are capable of being accessed by GFS clients using standard UNIX command, Col. 5, Lines 40-45 and Col. 9, Lines 27-28, and by using UNIX command, a name of a unit of data, e.g., file name, has to be specified corresponding to a read, write operation received by DATA STORAGE DEVICE LOCK, Col. 9, Lines 52-56) and managing access information used when said hosts sends a read request or a write request to said

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storage (Col. 9, Lines 56-62), wherein each of said storages includes a storage device and a virtual space defined therein for storing data (Col. 8, Lines 33-49).

Soltis fails to teach a controller for controlling data transfer through said data transfer network so as to assign said data to the virtual space according to an instruction from said management facility and store said data assigned to the virtual space in said storage device, and for processing the read request or the write request from said hosts by using said data stored in the virtual space.

However, as further discloses by Soltis, before a client is allowed to access the data stored in storage blocks, a lock has to be acquired (Col. 19, Lines 23-27), then the client is notified for accessing the storage blocks (Col. 15, Line 40-Col. 16, Line 41).

Dang teaches a system for managing I/O request directed to a disk array (Dang, abstract). As shown in Dang FIG. 2 is a RAID storage device 26 with a plurality of disk array. Corresponding to an I/O operation, a virtual disk I/O request corresponding to the I/O operation is created, and stored in RAM 14 as *a virtual space*. A virtual disk I/O request can either be a write request to write data to the disk array 26, or a read request to read data from the disk array (Dang, Col. 6, lines 39-57). The request is broken into one or more sub-requests (Dang, Col. 7, lines 15-16), and stored in a pending queue (Dang, Col. 8, lines 14-15). If the request is a write request (Dang, FIG. 7A, step 204), the data are written into appropriate disk drives of disk array 26 as *storage device* (Dang, Col. 7, lines 44-53). The Dang technique as discussed indicates *a controller for controlling data transfer through said data transfer network so as to assign said data to the virtual space and store said data assigned to the virtual space in said storage device, and for processing the read request or the write request from said hosts by using said data stored in the virtual space*, and this technique is a

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must in order to read or write data into the storage blocks of NETWORK STORAGE POOL *according to* the notification for accessing the storage blocks as *an instruction from said management facility*.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the Soltis network file system by including a controller for assigning data to a virtual space before storing in storage device as taught by Dang in order to minimize the amount of time required for performing read write operation in RAID storage device of storage area network.

Regarding claim 6, Soltis teaches a data management system for storages, suitable for a system having a plurality of hosts (FIG. 4, GFS CLIENTS) and a plurality of storages (FIG. 4, NETWORK STORAGE POOL) connected to a data transfer network (FIG. 4, SAN), comprising:

a host for obtaining files from said storages (FIG. 4, GFS CLIENTS);

a server for managing files present apart from said host (DATA STORAGE DEVICE LOCK, Col. 9, Lines 48-56);

a converter facility (VFS), included in each said host, for converting files of a format specific to an operating system on said host into format files having a format common to said storages (as illustrated at Col. 9, Lines 21-28, files under IRIX operating system in GFS CLIENT of FIG. 4 are converted into files common to storages by using VFS, the function of VFS is further disclosed in Pub. No. 2004/0260853 A1 at paragraph [0072]); and

wherein said server (DATA STORAGE DEVICE LOCK, Col. 9, Lines 48-56), connected to said data transfer networks (Col. 8, Lines 15-20), receives a file name of a file in said format specific to the operating system on said host and manages transmission of said generic format files in response to an access permission request including said file name of a file in said format specific to the operating system on said host from one of said storages (data files of storage devices are capable of being accessed by GFS clients using standard UNIX command, Col. 5, Lines 40-45 and Col. 9, Lines 27-28, and by using UNIX command, a name of a unit of data, e.g., file name, has to be specified corresponding to a read, write operation received by DATA STORAGE DEVICE LOCK, Col. 9, Lines 52-62), wherein each of said storages includes a storage device and a virtual space defined therein for storing data (Col. 8, Lines 33-49).

Soltis fails to teach a controller for controlling data transfer through said data transfer network so as to assign said data to the virtual space according to an instruction from said management facility and store said data assigned to the virtual space in said storage device, and for processing the read request or the write request from said hosts by using said data stored in the virtual space.

However, as further discloses by Soltis, before a client is allowed to access the data stored in storage blocks, a lock has to be acquired (Col. 19, Lines 23-27), then the client is notified for accessing the storage blocks (Col. 15, Line 40-Col. 16, Line 41).

Dang teaches a system for managing I/O request directed to a disk array (Dang, abstract). As shown in Dang FIG. 2 is a RAID storage device 26 with a plurality of disk array. Corresponding to an I/O operation, a virtual disk I/O request corresponding to the I/O operation is created, and stored in RAM 14 as *a virtual space*. A virtual disk I/O

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request can either be a write request to write data to the disk array 26, or a read request to read data from the disk array (Dang, Col. 6, lines 39-57). The request is broken into one or more sub-requests (Dang, Col. 7, lines 15-16), and stored in a pending queue (Dang, Col. 8, lines 14-15). If the request is a write request (Dang, FIG. 7A, step 204), the data are written into appropriate disk drives of disk array 26 as *storage device* (Dang, Col. 7, lines 44-53). The Dang technique as discussed indicates *a controller for controlling data transfer through said data transfer network so as to assign said data to the virtual space and store said data assigned to the virtual space in said storage device, and for processing the read request or the write request from said hosts by using said data stored in the virtual space*, and this technique is a must in order to read or write data into the storage blocks of NETWORK STORAGE POOL *according to* the notification for accessing the storage blocks as *an instruction from said management facility*.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the Soltis network file system by including a controller for assigning data to a virtual space before storing in storage device as taught by Dang in order to minimize the amount of time required for performing read write operation in RAID storage device of storage area network.

Regarding claim 9, Soltis teach a system having a plurality of storages (FIG. 4, NETWORK STORAGE POOL) and hosts (FIG. 4, GFS CLIENTS) connected o a data transfer network (FIG. 4, SAN), comprising:

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a host (FIG. 4, GFS CLIENTS) having a file system for converting files in a file format specific to an operating system of said host into files in a file format common to said storages (as illustrated at Col. 9, Lines 21-28, files under IRIX operating system in GFS CLIENT of FIG. 4 are converted into files common to storages by using VFS), and converting files in said common file format on said data transfer network into files in said file format specific to said operation system of said host (Col. 10, 62-65, the function of VFS is further disclosed in Pub. No. 2004/0260853 A1 at paragraph [0072]), and said host updating data in said file format specific to said operating system (Col. 9, Lines 18-41); and

a management facility (DATA STORAGE DEVICE LOCK, Col. 9, Lines 48-56), connected to said hosts and said storages by way of said data transfer network (Col. 8, Lines 15-20), for receiving a file name of a file in said format specific to the operating system on said host (data files of storage devices are capable of being accessed by GFS clients using standard UNIX command, Col. 5, Lines 40-45 and Col. 9, Lines 27-28, and by using UNIX command, a name of a unit of data, e.g., file name, has to be specified corresponding to a read, write operation received by DATA STORAGE DEVICE LOCK, Col. 9, Lines 52-56) and managing access information (Col. 9, Lines 56-62) used when said hosts sends a read request or a write request to said storages (Col. 8, Lines 33-49), wherein each storage includes a file storage area for storing files in a format common to said storages, a virtual space for retaining files that may be transmitted and received to and from said host or another storage and that is in said format common to said storages (Col. 8, Lines 33-49).

Soltis fails to teach *a storage controller for asynchronously allocating said file read out from said file storage area to said virtual space to transmit to said host said file in said virtual space, and for processing the read request or the write request from said hosts by using said file stored in said virtual space.*

Dang teaches a system for managing I/O request directed to a disk array (Dang, abstract). As shown in Dang FIG. 2 is a RAID storage device 26 with a plurality of disk array. Corresponding to an I/O operation, a virtual disk I/O request corresponding to the I/O operation is created, and stored in RAM 14. As seen, the RAM 14 is *a virtual space for retaining file that may be transmitted and received to and from said host or another storage.* A virtual disk I/O request can either be a write request to write data to the disk array 26, or a read request to read data from the disk array (Dang, Col. 6, lines 39-57). The request is broken into one or more sub-requests (Dang, Col. 7, lines 15-16), and stored in a pending queue (Dang, Col. 8, lines 14-15). If the request is a write request (Dang, FIG. 7A, step 204), the data are written into appropriate disk drives of disk array 26 (Dang, Col. 7, lines 44-53). As seen, by putting I/O request in a queue, files from RAID 26 as *file storage area* are *asynchronously allocated* into a queue and stored in RAM 14 as *virtual space* for transmitting to a host. In other words, the Dang technique of controlling the read request indicates *a storage controller for asynchronously allocating said file read out from said file storage area to said virtual space to transmit to said host said file in said virtual space, and for processing the read request or the write request from said hosts by using said file stored in said virtual space.*

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the Soltis network file system by including a

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controller for assigning data to a virtual space before storing in storage device as taught by Dang in order to minimize the amount of time required for performing read write operation in RAID storage device of storage area network.

Regarding claims 2 and 5, Soltis and Dang, in combination, teach all of the claimed subject matter as discussed above with respect to claims 1 and 4, Soltis further discloses *said unit of data specific to said operating system has an actual data section and a first control section for defining the type of data specific to said operation system, and wherein said converter facility considers the entire unit as said actual data to add to said unit of data specific to said operating system a second control section created for managing the type of data and for being common to said storages* (Soltis, FIG. 6).

Regarding claim 3, Soltis and Dang, in combination, teach all of the claimed subject matter as discussed above with respect to claim 2, Soltis further discloses *data transfer network is a storage area network* (Soltis, FIG. 4).

Regarding claim 7, Soltis and Dang, in combination, teach all of the claimed subject matter as discussed above with respect to claim 6, Soltis further discloses a *storage for storing said common format files* (Soltis, FIG. 4), *wherein said server issues to said storage a staging request with a file operation ID added with respect to a file requested for said access permission, and sends said file operation ID on condition that any error occurs; wherein said storage stages said file in accordance with said staging request and add said file operation ID to said file, and*

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wherein said host obtains said file by issuing a file operation request to said storage with said file operation ID added (Soltis, Col. 15, Lines 25-Col. 16, Line 65).

Regarding claim 8, Soltis and Dang, in combination, teach all of the claimed subject matter as discussed above with respect to claim 7, Soltis further discloses that *file operation ID is for use in the acknowledgement of access right of said host* (Soltis, Col. 15, Lines 25-Col. 16, Line 65).

Regarding claim 10, Soltis and Dang, in combination, teach all of the claimed subject matter as discussed above with respect to claim 9, Soltis further discloses *said data transfer network comprises a plurality of fibre switches having hosts and/or storage devices connected thereto and a storage area network for connecting these components* (Soltis, Col. 8, Lines 10-32).

Regarding claim 11, Soltis and Dang, in combination, teach all of the claimed subject matter as discussed above with respect to claim 9, Soltis further discloses *said file in said file format specific to said operating system is comprised of actual data and a file control section for defining the file type thereof; and wherein said file system considers said actual data plus said file control section as an actual data entirely to create another file control section common to said storages, said file in said file format specific to said operating system being converted to a file in said file format common to said storage storages by adding said another control section to said file in said file format specific to said operating system* (Soltis, FIG. 6).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

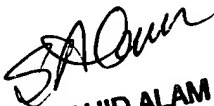
Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG Q PHAM whose telephone number is 571-272-4040. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BREENE can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner Hung Pham
March 25, 2005


SHAHID ALAM
PRIMARY EXAMINER